# CLAIMS

What is claimed:

1.   A superabsorbent polymer comprising

a) from about 55 to about 99.9 wt.% of polymerizable unsaturated acid group containing monomers;

b) from about 0.001 to about 5.0 wt.% of internal crosslinking agent;

c) from about 0.001 to about 5.0 wt.% of surface crosslinking agent applied to the particle surface;

d) from 0 to about 5 wt.% of a penetration modifier immediately before, during or immediately after the surface crosslinking step;

e) from 0 to about 5 wt.% of a multivalent metal salt on the surface;

f) from 0 to 2 wt% of a surfactant on the surface;

g) from about 0.01 to about 5 wt% of an insoluble, inorganic powder; and

h) from about 0.01 to 5wt% of a thermoplastic polymer having a thermoplastic melt temperature wherein the thermoplastic polymer is applied on the particle surface coincident with or followed by a temperature at least about the thermoplastic melt temperature or greater,

wherein the composition has a degree of neutralization of more than about 25%; having the characteristics of centrifuge retention capacity of about 25g/g or more; a gel bed permeability I of about $500 \times 10^{-9} cm^2$ or more; or a gel bed permeability II of about $300 \times 10^{-9} cm^2$ or more.

2. The superabsorbent polymer according to claim 1 wherein GBP I is at least about

$$[54000e^{-0.18x} + 100] \, x10^{-9}cm^2$$

3. The superabsorbent polymer according to claim 1 wherein GBP I is at least about

$$[54000e^{-0.175x} + 100] \, x10^{-9}cm^2.$$

4. The superabsorbent polymer according to claim 1 wherein GBP I is at least about

$$[54000e^{-0.17x} + 100] \, x10^{-9}cm^2.$$

5. The superabsorbent polymer according to claim 1 wherein GBP I is at least about

$$[54000e^{-0.165x} + 100] \, x10^{-9}cm^2$$

6. The superabsorbent polymer of claim 1 wherein the thermoplastic polymer is selected from the group consisting of polyolefin, polyethylene, polyesters, polyurethanes, linear low density polyethylene (LLDPE), ethylene acrylic acid copolymer (EAA), styrene copolymers, ethylene alkyl methacrylate copolymer (EMA), polypropylene (PP), ethylene vinyl acetate copolymer (EVA) and blends and copolymers thereof.

7. The superabsorbent polymer of claim 1 having a Dust Values of about 4 or less.

8. The superabsorbent polymer of claim 1 having a gel bed permeability I of about 800 $x10^{-9}cm^2$ or more; or a gel bed permeability II of about 500 $x10^{-9}cm^2$ or more.

9. The superabsorbent polymer of claim 1 having a shear modulus of less than about 9500 dynes/cm$^2$.

10. The superabsorbent polymer of claim 1 having a shear modulus from about 4000 dynes/cm$^2$ to about 8500 dynes/cm$^2$

11. A superabsorbent polymer comprising

a) from about 55 to about 99.9 wt.% of polymerizable unsaturated acid group containing monomers;

b) from about 0.001 to about 5.0 wt.% of internal crosslinking agent;

c) from about 0.001 to about 5.0 wt.% of surface crosslinking agent applied to the particle surface;

d) from 0 to about 5 wt.% of a penetration modifier immediately before, during or immediately after the surface crosslinking step;

e) from 0 to about 5 wt.% of a multivalent metal salt on the surface;

f) from 0 to 2 wt% of a surfactant on the surface;

g) from about 0.01 to 5wt% of a thermoplastic polymer having a thermoplastic melt temperature wherein the thermoplastic polymer is applied on the particle surface coincident with or followed by a temperature at least about the thermoplastic melt temperature or greater,

wherein the composition has a degree of neutralization of more than about 25%; having the characteristics of centrifuge retention capacity of about 25g/g or more; a gel

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bed permeability I of about $200 \times 10^{-9} cm^2$ or more; or a gel bed permeability II of about

$150 \times 10^{-9} cm^2$ or more.

12. The superabsorbent polymer according to claim 8 wherein GBP I is at least about

$[54000e^{-0.18x} + 100] \times 10^{-9} cm^2$

13. The superabsorbent polymer according to claim 8 wherein GBP I is at least about

$[54000e^{-0.175x} + 100] \times 10^{-9} cm^2$

14. The superabsorbent polymer according to claim 8 wherein GBP I is at least about

$[54000e^{-0.17x} + 100] \times 10^{-9} cm^2$

15. The superabsorbent polymer according to claim 8 wherein GBP I is at least about

$[54000e^{-0.165x} + 100] \times 10^{-9} cm^2$

16. The superabsorbent polymer of claim 8 wherein the thermoplastic polymer is

selected from the group consisting of polyolefin, polyethylene, polyesters,

polyurethanes, linear low density polyethylene (LLDPE), ethylene alkyl acrylate

copolymer (EAA), ethylene alkyl methacrylate copolymer (EMA), polypropylene

(PP), ethylene vinyl acetate copolymer (EVA) and blends and copolymers thereof.

17. The superabsorbent polymer of claim 8 having a Dust Values of about 4 or less.

18. The superabsorbent polymer of claim 10 having a shear modulus of less than about 9500 dynes/cm$^2$.

19. The superabsorbent polymer of claim 10 having a shear modulus from about 4000 dynes/cm$^2$ to about 8500 dynes/cm$^2$.